Memo

To: 250 / Janine Pollack for GET

From: 250 / Proxtronics Goddard Water Team

Date: October 31, 2008

Attachments: 2008 Annual Drinking Water Study Sample Results, EPA 2006 Edition of the Drinking Water Standards and Health Advisories, GSFC Map with Drinking Water Distribution Zones

Re: 2008 Annual Drinking Water Results for GSFC

The Proxtronics Goddard Team (PGT) conducted annual drinking water testing for Goddard Space Flight Center (GSFC). Buildings were selected throughout the main campus, zones 1 through 6. A minimum of one building was selected from each zone. Both pumping stations, and primary buildings from each remote area were analyzed. At each location, the sample was taken from a common use area. The samples were collected on September 5 (Buildings 4, 9A, 30A, 90), September 6 (Buildings 7, 21, Duplicate 800, 27), and September 7 (Buildings 1, 17, 20, 25, 32, 201, 302, 405). The sites were analyzed for the following parameters: Alkalinity, Bacterial Analysis, Chloride, Free Available Chlorine (FAC), Haloacetic Acids (HAA), Hardness, Metals Analysis, Nitrate, Orthophosphate, pH, Sulfate, Temperature, Total Dissolved Solids (TDS), Total Organic Carbon, and Total Trihalomethanes (TTHM). A report of these results is attached.

The following is an outline of parameters that did not meet our goals or are areas of concern, based on the EPA's 2006 Edition of Drinking Water Standards:

- Buildings 30A (West Pump House Station), 90, 20, and 405 did not meet the primary standard for TTHM. The primary standard for TTHM's is 80 ug/L.

  At Building 30A the TTHM result was 114 ug/L. This exceedance was caused by a Chloroform result of 100 ug/L, a Bromodichloromethane result of 12 ug/L, and a Dibromochloromethane result of 2 ug/L. Based on the *EPA 2006 Edition of the Drinking Water Standards and Health Advisories*, the Chloroform reference dose for an adult to be at risk is 10 ug/kg/day, the Bromodichloromethane reference dose is 3 ug/kg/day, and the Dibromochloromethane reference dose is 20 ug/kg/day. With respect to Chloroform, an average sized adult would need to drink 7 liters of water a day to reach the exposure level. With respect to Bromodichloromethane, an average sized adult would need to drink 17.5 liters of water a day to reach the exposure level. With respect to Dibromochloromethane, an average sized adult would need to drink 700 liters of water per day to reach the exposure level. From this analysis, none of the TTHM constituents pose a health risk.

  At Building 90 the TTHM result was 93.6 ug/L. This exceedance was caused by a Chloroform result of 76 ug/L, a Bromodichloromethane result of 15 ug/L, and a Dibromochloromethane

result of 2.6 ug/L. Based on the *EPA 2006 Edition of the Drinking Water Standards and Health Advisories,* a child should not be exposed to any higher than 4,000 ug/L of Chloroform, 1000 ug/L of Bromodichloromethane, and 600 ug/L of Dibromochloromethane per day. Also based on EPA Health Advisories, with respect to Chloroform, an average sized adult would need to drink 9.2 liters of water a day to reach the exposure level. With respect to Bromodichloromethane, an average sized adult would need to drink 14 liters of water a day to reach the exposure level. With respect to Dibromochloromethane, an average sized adult would need to drink 538.5 liters of water per day to reach the exposure level. From this analysis, none of the TTHM constituents pose a health risk.

At Building 20 the TTHM result was 86.9 ug/L. This exceedance was caused by a Chloroform result of 70 ug/L, a Bromodichloromethane result of 14 ug/L, and a Dibromochloromethane result of 2.9 ug/L. Based on the *EPA 2006 Edition of the Drinking Water Standards and Health Advisories*, with respect to Chloroform, an average sized adult would need to drink 10 liters of water a day to reach the exposure level. With respect to Bromodichloromethane, an average sized adult would need to drink 15 liters of water a day to reach the exposure level. With respect to Dibromochloromethane, an average sized adult would need to drink 482.8 liters of water per day to reach the exposure level. From this analysis, none of the TTHM constituents pose a health risk.

At Building 405 the TTHM result was 85.8 ug/L. This exceedance was caused by a Chloroform result of 71 ug/L, a Bromodichloromethane result of 12 ug/L, and a Dibromochloromethane result of 2.8 ug/L. Based on the *EPA 2006 Edition of the Drinking Water Standards and Health Advisories*, with respect to Chloroform, an average sized adult would need to drink 9.9 liters of water a day to reach the exposure level. With respect to Bromodichloromethane, an average sized adult would need to drink 17.5 liters of water a day to reach the exposure level. With respect to Dibromochloromethane, an average sized adult would need to drink 500 liters of water per day to reach the exposure level. From this analysis, none of the TTHM constituents pose a health risk.

- Buildings 30A, 201, and 405 did not meet the secondary standard for pH. The secondary standard for pH is between (6.5 - 8.5).

  At Building 30A the pH reading was 9.69. Water with a high pH can cause aesthetic problems such as scale build-up in plumbing, lowered efficiency of electric water heaters, and can make the taste of water bitter. This factor does not pose a health risk.

  Building 201 had a pH reading of 6.48. Low pH present in the sample could present corrosion problems and lead to leaching of metals in the water distributed. Low pH also may cause a sour or metallic taste in the drinking water. The margin of error for the Hanna pH meter is +/- 0.20. Therefore, the difference of 0.02 between the low pH reading of 6.48 and the standard of 6.5 is well within the margin of error of the sampling equipment. Samples taken after flushing found the metals levels to be below the goal and thus not a health concern.

  Building 405 had a pH reading of 8.75. As mentioned previously, water with a high pH can cause aesthetic problems, scale build-up, and can make the taste of water bitter. This factor does not pose a health risk. Samples taken after flushing found the metals levels to be below the goal and thus not a health concern.

- The Langlier Index (LI) is an indication of the water's likeliness to corrode pipes and fittings. Corrosion can lead to the leaching of metals into the water distributed, especially after remaining stagnant in the piping for an extended period of time, such as overnight. Buildings 4, 9, 21, 1, and 201 were found to be mildly corrosive. Building 30 was found to have the propensity for mild scaling. All other buildings tested were found to be near balanced on the LI.

- Orthophosphate is added to the water by the water provider, Washington Suburban Sanitary Commission (WSSC), at a concentration of 1000 ug/L in order to coat the distribution system piping. This additive helps prevent corrosion which could cause the release of lead and copper from pipes and fittings. The highest concentration sampled on center was 400 ug/L and the lowest was <20 ug/L. This chemical is apparently consumed before reaching GSFC. Samples taken after flushing found the metals levels to be below our goal and thus not a health concern.

2008 Annual Drinking Water Study
Sample Results

Results of Annual Drinking Water Sampling for 1/1/2008 through 12/31/2008

Date	Time	Bldg	Location	Analyte	Results	Standard and Type	
8/5/2008	11:09	004	Room 143A- Kitchen/ break room sink	Alkalinity	43,000 ug/l	ug/l NA	Sample ID: 20080805-004
				Bromodichloromethane	13 ug/l	80 ug/l P	
				Bromoform	<0.5 ug/l	80 ug/l P	
				Cadmium	0.5 ug/l	5 ug/l P	
				Chloride	29,000 ug/l	250,000 ug/l S	
				Chloroform	50 ug/l	80 ug/l P	
				Copper	14.9 ug/l	1,000 ug/l S	
				Degrees C	23.9 degrees C	degrees C NA	
				Dibromoacetic Acid	1.8 ug/l	60 ug/l NA	
				Dibromochloromethane	2.5 ug/l	80 ug/l P	
				Dichloroacetic Acid	17 ug/l	60 ug/l P	
				Fecal coliform	<1.1 CFU	CFU NA	
				Free available chlorine	920 ug/l	4,000 ug/l P	
				Haloacetic acids	33 ug/l	60 ug/l P	
				Hardness	75,000 ug/l	ug/l NA	
				Heterotrophic plate count	1 CFU	500 CFU P	
				Iron	<250 ug/l	300 ug/l S	
				Langlier Index	-0.88 units	NA	
				Lead	<10 ug/l	15 ug/l AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l P	
				Nitrate	850 ug/l	10,000 ug/l P	
				Orthophosphate	37 ug/l	NA	
				pH	7.33 pH	6.5-8.5 pH S	
				Sulfate	9,000 ug/l	250,000 ug/l S	
				Total Coliform	<1.1 CFU	0 CFU P	
				Total Dissolved Solids	170,000 ug/l	500,000 ug/l S	
				Total organic carbon	2,000 ug/l	ug/l NA	
				Total trihalomethanes	65.5 ug/l	80 ug/l P	
				Trichloroacetic Acid	14 ug/l	60 ug/l P	
				Zinc	121 ug/l	5,000 ug/l S	
8/5/2008	11:55	009A	Inside pump station- hose connection at blue pipe	Alkalinity	41,000 ug/l	ug/l NA	Sample ID: 20080805-009A

P = Primary Standard S = Secondary Standard (Aesthetics) AL = Action Level NA = Not Applicable (No standard)

Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/5/2008	11:55	009A	Inside pump station- hose connection at blue pipe	Bromodichloromethane	10 ug/l	80 ug/l	P	Sample ID: 20080805-009A
				Bromoform	<0.5 ug/l	80 ug/l	P	
				Cadmium	0.45 ug/l	5 ug/l	P	
				Chloride	29,000 ug/l	250,000 ug/l	S	
				Chloroform	32 ug/l	80 ug/l	P	
				Copper	5.9 ug/l	1,000 ug/l	S	
				Degrees C	26.9 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	2.1 ug/l	80 ug/l	P	
				Dichloroacetic Acid	13 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	1,000 ug/l	4,000 ug/l	P	
				Haloacetic acids	24 ug/l	60 ug/l	P	
				Hardness	83,000 ug/l	ug/l	NA	
				Heterotrophic plate count	1 CFU	500 CFU	P	
				Iron	<250 ug/l	300 ug/l	S	
				Langlier Index	-1 units		NA	
				Lead	<10 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	860 ug/l	10,000 ug/l	P	
				Orthophosphate	28 ug/l		NA	
				pH	7.14 pH	6.5-8.5 pH	S	
				Sulfate	8,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	170,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	44.1 ug/l	80 ug/l	P	
				Trichloroacetic Acid	11 ug/l	60 ug/l	P	
				Zinc	117 ug/l	5,000 ug/l	S	
8/5/2008	11:55	030A	Inside pump station- hose connection in back	Alkalinity	58,000 ug/l	ug/l	NA	Sample ID: 20080805-030A
				Bromodichloromethane	12 ug/l	80 ug/l	P	
				Bromoform	<0.5 ug/l	80 ug/l	P	

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Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/5/2008	11:55	030A	Inside pump station- hose connection in back	Cadmium	0.5 ug/l	5 ug/l	P	Sample ID: 20080805-030A
				Chloride	29,000 ug/l	250,000 ug/l	S	
				Chloroform	100 ug/l	80 ug/l	P	
				Copper	5.7 ug/l	1,000 ug/l	S	
				Degrees C	25.9 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	2 ug/l	80 ug/l	P	
				Dichloroacetic Acid	5.9 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	180 ug/l	4,000 ug/l	P	
				Haloacetic acids	5.9 ug/l	60 ug/l	P	
				Hardness	94,000 ug/l	ug/l	NA	
				Heterotrophic plate count	56 CFU	500 CFU	P	
				Iron	<250 ug/l	300 ug/l	S	
				Langlier Index	1.66 units		NA	
				Lead	<10 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	1,000 ug/l	10,000 ug/l	P	
				Orthophosphate	<20 ug/l		NA	
				pH	9.69 pH	6.5-8.5 pH	S	
				Sulfate	10,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	180,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	114 ug/l	80 ug/l	P	
				Trichloroacetic Acid	<1 ug/l	60 ug/l	P	
				Zinc	496 ug/l	5,000 ug/l	S	
8/5/2008	10:17	090	Room 106B (Kitchen)- small utility sink	Alkalinity	48,000 ug/l	ug/l	NA	Sample ID: 20080805-090 pH was recalibrated due to high pH reading for the first reading. HPC was quantified over reported value.
				Bromodichloromethane	15 ug/l	80 ug/l	P	
				Bromoform	<0.5 ug/l	80 ug/l	P	
				Cadmium	0.52 ug/l	5 ug/l	P	

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Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/5/2008	10:17	090	Room 106B (Kitchen)- small utility sink	Chloride	29,000 ug/l	250,000 ug/l	S	Sample ID: 20080805-090 pH was recalibrated due to high pH reading for the first reading. HPC was quantified over reported value.
				Chloroform	76 ug/l	80 ug/l	P	
				Copper	6.3 ug/l	1,000 ug/l	S	
				Degrees C	24.9 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	2.6 ug/l	80 ug/l	P	
				Dichloroacetic Acid	8.1 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	60 ug/l	4,000 ug/l	P	
				Haloacetic acids	17 ug/l	60 ug/l	P	
				Hardness	85,000 ug/l	ug/l	NA	
				Heterotrophic plate count	74 CFU	500 CFU	P	
				Iron	<250 ug/l	300 ug/l	S	
				Langlier Index	0.15 units		NA	
				Lead	<10 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	910 ug/l	10,000 ug/l	P	
				Orthophosphate	<20 ug/l		NA	
				pH	8.25 pH	6.5-8.5 pH	S	
				Sulfate	9,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	180,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	93.6 ug/l	80 ug/l	P	
				Trichloroacetic Acid	9.1 ug/l	60 ug/l	P	
				Zinc	116 ug/l	5,000 ug/l	S	

Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/6/2008	11:58	007	Room 194- kitchenette sink	Alkalinity	45,000 ug/l	ug/l	NA	Sample ID: 20080806-7
				Bromodichloromethane	9.9 ug/l	80 ug/l	P	
				Bromoform	<0.5 ug/l	80 ug/l	P	
				Cadmium	<0.25 ug/l	5 ug/l	P	
				Chloride	30,000 ug/l	250,000 ug/l	S	
				Chloroform	48 ug/l	80 ug/l	P	
				Copper	7.3 ug/l	1,000 ug/l	S	
				Degrees C	25.2 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	2.2 ug/l	80 ug/l	P	
				Dichloroacetic Acid	4.5 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	40 ug/l	4,000 ug/l	P	
				Haloacetic acids	6.5 ug/l	60 ug/l	P	
				Hardness	75,000 ug/l	ug/l	NA	
				Heterotrophic plate count	<1 CFU	500 CFU	P	
				Iron	6 ug/l	300 ug/l	S	
				Langlier Index	-0.26 units		NA	
				Lead	0.27 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	1,000 ug/l	10,000 ug/l	P	
				Orthophosphate	270 ug/l		NA	
				pH	7.92 pH	6.5-8.5 pH	S	
				Sulfate	9,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	190,000 ug/l	500,000 ug/l	S	
				Total organic carbon	1,000 ug/l	ug/l	NA	
				Total trihalomethanes	60.1 ug/l	80 ug/l	P	
				Trichloroacetic Acid	2 ug/l	60 ug/l	P	
				Zinc	4.5 ug/l	5,000 ug/l	S	
8/6/2008	10:38	021	Rm. L080 (Cafeteria)	Alkalinity	42,000 ug/l	ug/l	NA	Sample ID: 20080806-21 Sample duplicate of this bldg. Sample Duplicate ID: 20080806-800
				Bromodichloromethane	10 ug/l	80 ug/l	P	
				Bromoform	<0.5 ug/l	80 ug/l	P	

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Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/6/2008	10:38	021	Rm. L080 (Cafeteria)	Cadmium	<0.25 ug/l	5 ug/l	P	Sample ID: 20080806-21 Sample duplicate of this bldg. Sample Duplicate ID: 20080806-800
				Chloride	28,000 ug/l	250,000 ug/l	S	
				Chloroform	37 ug/l	80 ug/l	P	
				Copper	7 ug/l	1,000 ug/l	S	
				Degrees C	25.1 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	2.4 ug/l	80 ug/l	P	
				Dichloroacetic Acid	15 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	680 ug/l	4,000 ug/l	P	
				Haloacetic acids	25 ug/l	60 ug/l	P	
				Hardness	77,000 ug/l	ug/l	NA	
				Heterotrophic plate count	<1 CFU	500 CFU	P	
				Iron	<25 ug/l	300 ug/l	S	
				Langlier Index	-1.12 units		NA	
				Lead	0.33 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	830 ug/l	10,000 ug/l	P	
				Orthophosphate	400 ug/l		NA	
				pH	7.06 pH	6.5-8.5 pH	S	
				Sulfate	9,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	160,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	49.4 ug/l	80 ug/l	P	
				Trichloroacetic Acid	9.8 ug/l	60 ug/l	P	
				Zinc	5.3 ug/l	5,000 ug/l	S	
8/6/2008	12:34	027	Janitor's Closet sink	Alkalinity	47,000 ug/l	ug/l	NA	Sample ID: 20080806-27
				Bromodichloromethane	12 ug/l	80 ug/l	P	
				Bromoform	<0.5 ug/l	80 ug/l	P	
				Cadmium	<0.25 ug/l	5 ug/l	P	
				Chloride	30,000 ug/l	250,000 ug/l	S	
				Chloroform	57 ug/l	80 ug/l	P	

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Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/6/2008	12:34	027	Janitor's Closet sink	Copper	5.5 ug/l	1,000 ug/l	S	Sample ID: 20080806-27
				Degrees C	26.9 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	2.6 ug/l	80 ug/l	P	
				Dichloroacetic Acid	14 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	80 ug/l	4,000 ug/l	P	
				Haloacetic acids	25 ug/l	60 ug/l	P	
				Hardness	77,000 ug/l	ug/l	NA	
				Heterotrophic plate count	9 CFU	500 CFU	P	
				Iron	11.2 ug/l	300 ug/l	S	
				Langlier Index	0.19 units		NA	
				Lead	1.2 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	950 ug/l	10,000 ug/l	P	
				Orthophosphate	310 ug/l		NA	
				pH	8.31 pH	6.5-8.5 pH	S	
				Sulfate	9,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	170,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	71.6 ug/l	80 ug/l	P	
				Trichloroacetic Acid	11 ug/l	60 ug/l	P	
				Zinc	2.5 ug/l	5,000 ug/l	S	
8/6/2008	10:38	800	Duplicate of Building 21	Alkalinity	43,000 ug/l	ug/l	NA	Sample ID: 20080806-800 Sample ID: 20080806-021 Perform duplicates: 800 is a duplicate of 21
				Bromodichloromethane	10 ug/l	80 ug/l	P	
				Bromoform	<0.5 ug/l	80 ug/l	P	
				Cadmium	<0.25 ug/l	5 ug/l	P	
				Chloride	28,000 ug/l	250,000 ug/l	S	
				Chloroform	37 ug/l	80 ug/l	P	
				Copper	9.2 ug/l	1,000 ug/l	S	
				Degrees C	25.1 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	

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Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/6/2008	10:38	800	Duplicate of Building 21	Dibromochloromethane	2.2 ug/l	80 ug/l	P	Sample ID: 20080806-800 Sample ID: 20080806-021 Perform duplicates: 800 is a duplicate of 21
				Dichloroacetic Acid	15 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	680 ug/l	4,000 ug/l	P	
				Haloacetic acids	25 ug/l	60 ug/l	P	
				Hardness	77,000 ug/l	ug/l	NA	
				Heterotrophic plate count	<1 CFU	500 CFU	P	
				Iron	<25.8 ug/l	300 ug/l	S	
				Langlier Index	-1.12 units		NA	
				Lead	0.39 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	1,000 ug/l	10,000 ug/l	P	
				Orthophosphate	390 ug/l		NA	
				pH	7.06 pH	6.5-8.5 pH	S	
				Sulfate	8,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	170,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	49.2 ug/l	80 ug/l	P	
				Trichloroacetic Acid	10 ug/l	60 ug/l	P	
				Zinc	4.6 ug/l	5,000 ug/l	S	

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Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/7/2008	10:17	001	Room 011 (cafeteria)- Right side sink	Alkalinity	40,000 ug/l	ug/l	NA	Sample ID: 20080807-1 Haloacetic Acids were resampled on 9/30/08 @ 09:11. Sample ID: 20080930-1
				Bromodichloromethane	9.4 ug/l	80 ug/l	P	
				Bromoform	<0.5 ug/l	80 ug/l	P	
				Cadmium	<0.25 ug/l	5 ug/l	P	
				Chloride	29,000 ug/l	250,000 ug/l	S	
				Chloroform	30 ug/l	80 ug/l	P	
				Copper	17.1 ug/l	1,000 ug/l	S	
				Degrees C	26.6 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	2.2 ug/l	80 ug/l	P	
				Dichloroacetic Acid	15 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	1,000 ug/l	4,000 ug/l	P	
				Haloacetic acids	28 ug/l	60 ug/l	P	
				Hardness	75,000 ug/l	ug/l	NA	
				Heterotrophic plate count	<1 CFU	500 CFU	P	
				Iron	<25 ug/l	300 ug/l	S	
				Langlier Index	-1.19 units		NA	
				Lead	<1 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	970 ug/l	10,000 ug/l	P	
				Orthophosphate	400 ug/l		NA	
				pH	7.01 pH	6.5-8.5 pH	S	
				Sulfate	8,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	170,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	41.6 ug/l	80 ug/l	P	
				Trichloroacetic Acid	13 ug/l	60 ug/l	P	
				Zinc	3.6 ug/l	5,000 ug/l	S	
8/7/2008	10:49	017	Across from room S228- Kitchenette sink	Alkalinity	43,000 ug/l	ug/l	NA	Sample ID: 20080807-17 Haloacetic Acids were resampled on 9/30/08 @ 08:59. Sample ID: 20080930-17
				Bromodichloromethane	11 ug/l	80 ug/l	P	

Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/7/2008	10:49	017	Across from room S228-Kitchenette sink	Bromoform	0.85 ug/l	80 ug/l	P	Sample ID: 20080807-17 Haloacetic Acids were resampled on 9/30/08 @ 08:59. Sample ID: 20080930-17
				Cadmium	<0.25 ug/l	5 ug/l	P	
				Chloride	29,000 ug/l	250,000 ug/l	S	
				Chloroform	42 ug/l	80 ug/l	P	
				Copper	11.4 ug/l	1,000 ug/l	S	
				Degrees C	27.5 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	2.9 ug/l	80 ug/l	P	
				Dichloroacetic Acid	9.8 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	590 ug/l	4,000 ug/l	P	
				Haloacetic acids	21.8 ug/l	60 ug/l	P	
				Hardness	77,000 ug/l	ug/l	NA	
				Heterotrophic plate count	<1 CFU	500 CFU	P	
				Iron	7 ug/l	300 ug/l	S	
				Langlier Index	-0.58 units		NA	
				Lead	<1 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	910 ug/l	10,000 ug/l	P	
				Orthophosphate	360 ug/l		NA	
				pH	7.57 pH	6.5-8.5 pH	S	
				Sulfate	12,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	180,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	56.75 ug/l	80 ug/l	P	
				Trichloroacetic Acid	12 ug/l	60 ug/l	P	
				Zinc	3 ug/l	5,000 ug/l	S	
8/7/2008	11:24	020	Room 074A- Janitor's closet sink	Alkalinity	55,000 ug/l	ug/l	NA	Sample ID: 20080807-20 Hanna pH meter went out of range. Switched from meter #2 to #1. Only free available chlorine is recorded. Haloacetic Acids were resampled on 9/30/08 @ 09:34. Sample ID: 20080930-20
				Bromodichloromethane	14 ug/l	80 ug/l	P	

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Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/7/2008	11:24	020	Room 074A- Janitor's closet sink	Bromoform	<0.5 ug/l	80 ug/l	P	Sample ID: 20080807-20 Hanna pH meter went out of range. Switched from meter #2 to #1. Only free available chlorine is recorded. Haloacetic Acids were resampled on 9/30/08 @ 09:34. Sample ID: 20080930-20
				Cadmium	<0.25 ug/l	5 ug/l	P	
				Chloride	29,000 ug/l	250,000 ug/l	S	
				Chloroform	70 ug/l	80 ug/l	P	
				Copper	4.4 ug/l	1,000 ug/l	S	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	2.9 ug/l	80 ug/l	P	
				Dichloroacetic Acid	2.5 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	190 ug/l	4,000 ug/l	P	
				Haloacetic acids	2.5 ug/l	60 ug/l	P	
				Hardness	90,000 ug/l	ug/l	NA	
				Heterotrophic plate count	19 CFU	500 CFU	P	
				Iron	<25 ug/l	300 ug/l	S	
				Langlier Index	0.01 units		NA	
				Lead	<1 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	1,000 ug/l	10,000 ug/l	P	
				Orthophosphate	230 ug/l		NA	
				Sulfate	9,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	200,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	86.9 ug/l	80 ug/l	P	
				Trichloroacetic Acid	<1 ug/l	60 ug/l	P	
				Zinc	3.1 ug/l	5,000 ug/l	S	
	12:25			Degrees C	26.1 degrees C	degrees C	NA	Sample ID: 20080807-020 Recalibrated Hanna pH meter because readings were off and instrument was flashing. Switched Hannah pH meter #2 to #1. pH and Temp were recorded here.
				pH	8.01 pH	6.5-8.5 pH	S	

Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/7/2008	8:48	025	Across from room S167	Alkalinity	45,000 ug/l	ug/l	NA	Sample ID: 20080807-25 Haloacetic Acids were resampled on 9/30/08 @ 08:37. Sample ID: 20080930-25
				Bromodichloromethane	12 ug/l	80 ug/l	P	
				Bromoform	<0.5 ug/l	80 ug/l	P	
				Cadmium	<0.25 ug/l	5 ug/l	P	
				Chloride	29,000 ug/l	250,000 ug/l	S	
				Chloroform	58 ug/l	80 ug/l	P	
				Copper	13.6 ug/l	1,000 ug/l	S	
				Degrees C	26.1 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	2.2 ug/l	80 ug/l	P	
				Dichloroacetic Acid	5.2 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	50 ug/l	4,000 ug/l	P	
				Haloacetic acids	17.2 ug/l	60 ug/l	P	
				Hardness	77,000 ug/l	ug/l	NA	
				Heterotrophic plate count	8 CFU	500 CFU	P	
				Iron	<25 ug/l	300 ug/l	S	
				Langlier Index	-0.69 units		NA	
				Lead	0.46 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	800 ug/l	10,000 ug/l	P	
				Orthophosphate	360 ug/l		NA	
				pH	7.45 pH	6.5-8.5 pH	S	
				Sulfate	8,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	160,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	72.2 ug/l	80 ug/l	P	
				Trichloroacetic Acid	12 ug/l	60 ug/l	P	
				Zinc	2.9 ug/l	5,000 ug/l	S	
8/7/2008	9:20	032	Room S130A- Pantry sink	Alkalinity	43,000 ug/l	ug/l	NA	Sample ID: 20080807-32 Haloacetic Acids were resampled on 9/30/08 @ 08:50. Sample ID: 20080930-32
				Bromodichloromethane	11 ug/l	80 ug/l	P	

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Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/7/2008	9:20	032	Room S130A- Pantry sink	Bromoform	1.2 ug/l	80 ug/l	P	Sample ID: 20080807-32 Haloacetic Acids were resampled on 9/30/08 @ 08:50. Sample ID: 20080930-32
				Cadmium	<0.25 ug/l	5 ug/l	P	
				Chloride	29,000 ug/l	250,000 ug/l	S	
				Chloroform	46 ug/l	80 ug/l	P	
				Copper	65.2 ug/l	1,000 ug/l	S	
				Degrees C	25.1 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	2.5 ug/l	80 ug/l	P	
				Dichloroacetic Acid	8 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	260 ug/l	4,000 ug/l	P	
				Haloacetic acids	21 ug/l	60 ug/l	P	
				Hardness	77,000 ug/l	ug/l	NA	
				Heterotrophic plate count	1 CFU	500 CFU	P	
				Iron	73.4 ug/l	300 ug/l	S	
				Langlier Index	-1.05 units		NA	
				Lead	0.33 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	800 ug/l	10,000 ug/l	P	
				Orthophosphate	370 ug/l		NA	
				pH	7.12 pH	6.5-8.5 pH	S	
				Sulfate	9,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	160,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	60.7 ug/l	80 ug/l	P	
				Trichloroacetic Acid	13 ug/l	60 ug/l	P	
				Zinc	2 ug/l	5,000 ug/l	S	
8/7/2008	12:50	201	Bathroom-sink	Alkalinity	49,000 ug/l	ug/l	NA	Sample ID: 20080807-201 Haloacetic Acids were resampled on 9/30/08 @ 09:50. Sample ID: 20080930-201
				Bromodichloromethane	15 ug/l	80 ug/l	P	
				Bromoform	<0.5 ug/l	80 ug/l	P	
				Cadmium	<0.25 ug/l	5 ug/l	P	

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Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/7/2008	12:50	201	Bathroom-sink	Chloride	30,000 ug/l	250,000 ug/l	S	Sample ID: 20080807-201 Haloacetic Acids were resampled on 9/30/08 @ 09:50. Sample ID: 20080930-201
				Chloroform	56 ug/l	80 ug/l	P	
				Copper	261 ug/l	1,000 ug/l	S	
				Degrees C	26.7 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	3.7 ug/l	80 ug/l	P	
				Dichloroacetic Acid	2.6 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	20 ug/l	4,000 ug/l	P	
				Haloacetic acids	2.6 ug/l	60 ug/l	P	
				Hardness	96,000 ug/l	ug/l	NA	
				Heterotrophic plate count	24 CFU	500 CFU	P	
				Iron	<25 ug/l	300 ug/l	S	
				Langlier Index	-1.54 units		NA	
				Lead	0.69 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	1,000 ug/l	10,000 ug/l	P	
				Orthophosphate	330 ug/l		NA	
				pH	6.48 pH	6.5-8.5 pH	S	
				Sulfate	18,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	200,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	74.7 ug/l	80 ug/l	P	
				Trichloroacetic Acid	<1 ug/l	60 ug/l	P	
				Zinc	3.8 ug/l	5,000 ug/l	S	
8/7/2008	13:27	302	Men's Bathroom- Slop sink	Alkalinity	58,000 ug/l	ug/l	NA	Sample ID: 20080807-302 Haloacetic Acids were resampled on 9/30/08 @ 10:43. Sample ID: 20080930-302
				Bromodichloromethane	15 ug/l	80 ug/l	P	
				Bromoform	<0.5 ug/l	80 ug/l	P	
				Cadmium	<0.25 ug/l	5 ug/l	P	
				Chloride	30,000 ug/l	250,000 ug/l	S	
				Chloroform	56 ug/l	80 ug/l	P	

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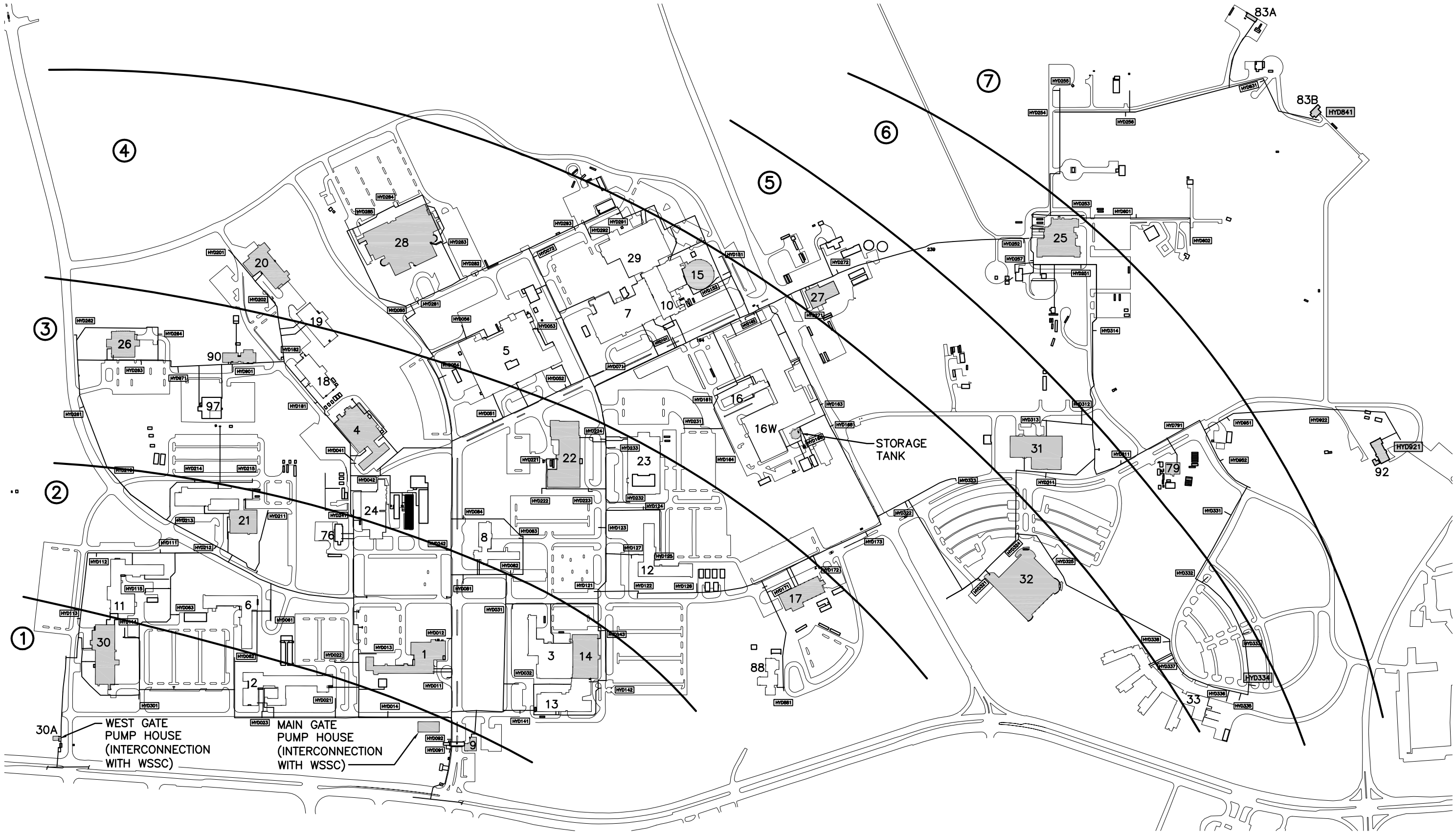
Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/7/2008	13:27	302	Men's Bathroom- Slop sink	Copper	7.6 ug/l	1,000 ug/l	S	Sample ID: 20080807-302 Haloacetic Acids were resampled on 9/30/08 @ 10:43. Sample ID: 20080930-302
				Degrees C	26.3 degrees C	degrees C	NA	
				Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Dibromochloromethane	4 ug/l	80 ug/l	P	
				Dichloroacetic Acid	3.6 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	20 ug/l	4,000 ug/l	P	
				Haloacetic acids	9.1 ug/l	60 ug/l	P	
				Hardness	110,000 ug/l	ug/l	NA	
				Heterotrophic plate count	25 CFU	500 CFU	P	
				Iron	46.3 ug/l	300 ug/l	S	
				Langlier Index	-0.53 units		NA	
				Lead	0.72 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	880 ug/l	10,000 ug/l	P	
				Orthophosphate	260 ug/l		NA	
				pH	7.36 pH	6.5-8.5 pH	S	
				Sulfate	21,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	210,000 ug/l	500,000 ug/l	S	
				Total organic carbon	2,000 ug/l	ug/l	NA	
				Total trihalomethanes	75 ug/l	80 ug/l	P	
				Trichloroacetic Acid	5.5 ug/l	60 ug/l	P	
				Zinc	32 ug/l	5,000 ug/l	S	
8/7/2008	14:06	405	Kitchen-sink	Alkalinity	57,000 ug/l	ug/l	NA	Sample ID: 20080807-405 Haloacetic Acids were resampled on 9/30/08 @ 10:23. Sample ID: 20080930-405
				Bromodichloromethane	12 ug/l	80 ug/l	P	
				Bromoform	<0.5 ug/l	80 ug/l	P	
				Cadmium	0.03 ug/l	5 ug/l	P	
				Chloride	35,000 ug/l	250,000 ug/l	S	
				Chloroform	71 ug/l	80 ug/l	P	
				Copper	7.8 ug/l	1,000 ug/l	S	
				Degrees C	23.9 degrees C	degrees C	NA	

P = Primary Standard S = Secondary Standard (Aesthetics) AL = Action Level NA = Not Applicable (No standard)

Date	Time	Bldg	Location	Analyte	Results	Standard and Type		
8/7/2008	14:06	405	Kitchen-sink	Dibromoacetic Acid	<1 ug/l	60 ug/l	NA	Sample ID: 20080807-405 Haloacetic Acids were resampled on 9/30/08 @ 10:23. Sample ID: 20080930-405
				Dibromochloromethane	2.8 ug/l	80 ug/l	P	
				Dichloroacetic Acid	3.1 ug/l	60 ug/l	P	
				Fecal coliform	<1.1 CFU	CFU	NA	
				Free available chlorine	50 ug/l	4,000 ug/l	P	
				Haloacetic acids	3.1 ug/l	60 ug/l	P	
				Hardness	92,000 ug/l	ug/l	NA	
				Heterotrophic plate count	37 CFU	500 CFU	P	
				Iron	<25 ug/l	300 ug/l	S	
				Langlier Index	0.74 units		NA	
				Lead	1 ug/l	15 ug/l	AL	
				Monobromoacetic Acid	<1 ug/l	60 ug/l	NA	
				Monochloroacetic acid	<2 ug/l	60 ug/l	P	
				Nitrate	1,000 ug/l	10,000 ug/l	P	
				Orthophosphate	330 ug/l		NA	
				pH	8.75 pH	6.5-8.5 pH	S	
				Sulfate	12,000 ug/l	250,000 ug/l	S	
				Total Coliform	<1.1 CFU	0 CFU	P	
				Total Dissolved Solids	190,000 ug/l	500,000 ug/l	S	
				Total organic carbon	1,000 ug/l	ug/l	NA	
				Total trihalomethanes	85.8 ug/l	80 ug/l	P	
				Trichloroacetic Acid	<1 ug/l	60 ug/l	P	
				Zinc	2.8 ug/l	5,000 ug/l	S	

Report printed 10/31/2008 2:32:38 P

GSFC Map with Drinking Water Distribution Zones



NSWC1\C1USER1\1645\SHARED\NASA-GSFC\DRAWINGS\FIGURE 3-1.DWG

WESTON SOLUTIONS SM

FIGURE 3-1
SAMPLE LOCATIONS AND ZONES

NASA-GSFC

United States
Environmental Protection
Agency

2006 Edition of the Drinking Water Standards and Health Advisories

2006 Edition of the Drinking Water Standards and Health Advisories

EPA 822-R-06-013

Office of Water
U.S. Environmental Protection Agency
Washington, DC

Summer 2006
Date of update: August, 2006

The *Drinking Water Standards and Health Advisories* Tables are revised periodically by EPA's Office of Water in order to update RfD and Cancer values so that they are consistent with the most current Agency assessments of chemical contaminants that may occur in drinking water and to introduce new Health Advisories. The following information should be kept in mind when using the 2006 Edition of the Tables:

Reference dose (RfD) values are updated to reflect the values in the Integrated Risk Information System (IRIS) and the Office of Pesticide Programs (OPP) Reregistration Eligibility Decision (RED) Documents. The Drinking Water Equivalent Level (DWEL) has been adjusted accordingly. Thus, both the RfD and DWEL in the Tables differ from the values in the Health Advisory document when the IRIS or OPP RfD is more recent than the Health Advisory document value. RfD values from IRIS that differ from the values in the Health Advisory documents are presented in **BOLD** type. Values derived from the REDs are given in ***BOLD*** italics. For unregulated chemicals with a recent IRIS or OPP RfD, the lifetime Health Advisory is calculated from the DWEL using the relative source contribution value published in the Health Advisory document. For regulated chemicals, no lifetime value is provided in the Tables when the revised lifetime value would differ from the Maximum Contaminant Level Goal (MCLG).

The cancer group designation or cancer classification and 10^{-4} cancer risk values reflect those presently in IRIS or in the OPP RED. New IRIS cancer designations and 10^{-4} cancer risk values are presented in **BOLD** type and those derived from the REDs are in ***BOLD*** italics.

The IRIS Toxicological Reviews can be accessed at: http://www.epa.gov/IRIS. The OPP REDs can be accessed at: http://cfpub.epa.gov/oppref/rereg/status.cfm?show=rereg

In some cases there is a Health Advisory value for a contaminant but there is no reference to a Health Advisory document. These Health Advisory values can be found in the Drinking Water Criteria Document for the contaminant.

With a few exceptions, the RfDs, Health Advisory, and cancer risk values have been rounded to one significant figure following the convention adopted by IRIS.

The *Drinking Water Standards and Health Advisories* Tables may be reached from the Water Science home page at: http://www.epa.gov/waterscience. The Tables are accessed under the Health Advisories heading.

Copies the Tables may be ordered free of charge from

SAFE DRINKING WATER HOTLINE
1-800-426-4791
Monday thru Friday, 9:00 AM to 5:30 PM EST

DEFINITIONS

The following definitions for terms used in the Tables are not all-encompassing, and should not be construed to be "official" definitions. They are intended to assist the user in understanding terms found on the following pages.

Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. It is the level of lead or copper which, if exceeded in over 10% of the homes tested, triggers treatment for corrosion control.

Cancer Classification: A descriptive weight-of-evidence judgment as to the likelihood that an agent is a human carcinogen and the conditions under which the carcinogenic effects may be expressed. Under the 2005 EPA *Guidelines for Carcinogen Risk Assessment*, descriptive terms for carcinogenicity replace the earlier alpha numeric Cancer Group designations (US EPA 1986 guidelines). The suggested descriptive terms are as follows:

- Carcinogenic to humans (**H**)
- Likely to be carcinogenic to humans (**L**)
- Likely to be carcinogenic above a specified dose but not likely to be carcinogenic below that dose because a key event in tumor formation does not occur below that dose (**L/N**)
- Suggestive evidence of carcinogenic potential (**S**)
- Inadequate information to assess carcinogenic potential (**I**)
- Not likely to be carcinogenic to humans (**N**)

The letter abbreviations provided parenthetically above are now used in the Tables in place of the prior alpha numeric identifiers for chemicals that have been evaluated under the new guidelines (the 2005 guidelines or the 1996 and 1999 draft guidelines).

Cancer Group: A qualitative weight-of-evidence judgement as to the likelihood that a chemical may be a carcinogen for humans. Each chemical was placed into one of the following five categories (US EPA 1986 guidelines). The Cancer Group designation are given in the Tables for chemicals that have not yet been evaluated under the new guidelines.

Group Category

A Human carcinogen
B Probable human carcinogen:
  B1 indicates limited human evidence
  B2 indicates sufficient evidence in animals and inadequate or no evidence in humans
C Possible human carcinogen
D Not classifiable as to human carcinogenicity
E Evidence of noncarcinogenicity for humans

10^{-4} Cancer Risk: The concentration of a chemical in drinking water corresponding to an excess estimated lifetime cancer risk of 1 in 10,000.

Drinking Water Advisory: A nonregulatory concentration of a contaminant in water that is likely to be without adverse effects on health and aesthetics.

DWEL: Drinking Water Equivalent Level. A lifetime exposure concentration protective of adverse, non-cancer health effects, that assumes all of the exposure to a contaminant is from drinking water.

HA: Health Advisory. An estimate of acceptable drinking water levels for a chemical substance based on health effects information; a Health Advisory is not a legally enforceable Federal standard, but serves as technical guidance to assist Federal, State, and local officials.

> **One-Day HA:** The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to one day of exposure. The One-Day HA is normally designed to protect a 10-kg child consuming 1 liter of water per day.
>
> **Ten-Day HA:** The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure. The Ten-Day HA is also normally designed to protect a 10-kg child consuming 1 liter of water per day.
>
> **Lifetime HA:** The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for a lifetime of exposure. The Lifetime HA is based on exposure of a 70-kg adult consuming 2 liters of water per day. The Lifetime HA for Group C carcinogens includes an adjustment for possible carcinogenicity.

MCLG: Maximum Contaminant Level Goal. A non-enforceable health goal which is set at a level at which no known or anticipated adverse effect on the health of persons occurs and which allows an adequate margin of safety.

MCL: Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLG as feasible using the best available analytical and treatment technologies and taking cost into consideration. MCLs are enforceable standards.

RfD: Reference Dose. An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

SDWR: Secondary Drinking Water Regulations. Non-enforceable Federal guidelines regarding cosmetic effects (such as tooth or skin discoloration) or aesthetic effects (such as taste, odor, or color) of drinking water.

TT: Treatment Technique. A required process intended to reduce the level of a contaminant in drinking water.

ABBREVIATIONS

D	Draft
F	Final
NA	Not Applicable
NOAEL	No-Observed-Adverse-Effect Level
OPP	Office of Pesticide Programs
P	Proposed
Reg	Regulation
TT	Treatment Technique

Drinking Water Standards and Health Advisories

Chemicals	CASRN Number	Standards			Status HA Document	Health Advisories						Cancer Descriptor[1]
						10-kg Child						
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10^{-4} Cancer Risk	
ORGANICS												
Acenaphthene	83-32-9	-	-	-	-	-	-	0.06	2	-	-	-
Acifluorfen (sodium)	62476-59-9		-	-	F '88	2	2	0.01	0.4	-	0.1	***L/N***
Acrylamide	79-06-1	F	zero	TT[2]	F '87	1.5	0.3	0.0002	0.007	-	**0.0008**	B2
Acrylonitrile	107-13-1		-	-	-	-	-	-	-	-	0.006	B1
Alachlor	15972-60-8	F	zero	0.002	F '88	0.1	0.1	0.01	0.4	-	***0.04***	***B2***
Aldicarb[3]	116-06-3	F[4]	0.001	0.003	F '95	0.01	0.01	0.001	0.035	0.007	-	D
Aldicarb sulfone[3]	1646-88-4	F[4]	0.001	0.002	F '95	0.01	0.01	0.001	0.035	0.007	-	D
Aldicarb sulfoxide[3]	1646-87-3	F[4]	0.001	0.004	F '95	0.01	0.01	0.001	0.035	0.007	-	D
Aldrin	309-00-2	-	-	-	F '92	0.0003	0.0003	0.00003	0.001	-	0.0002	B2
Ametryn	834-12-8	-	-	-	F '88	9	9	0.009	0.3	0.06	-	D
Ammonium sulfamate	7773-06-0	-	-	-	F '88	20	20	0.2	8	2	-	D
Anthracene (PAH)[5]	120-12-7	-	-	-	-	-	-	0.3	10	-	-	D
Atrazine	1912-24-9	F	0.003	0.003	F '88	-	-	***0.02***	0.07	-	-	***N***
Baygon	114-26-1	-	-	-	F '88	0.04	0.04	0.004	0.1	0.003	-	C
Bentazon	25057-89-0	-	-	-	F '99	0.3	0.3	0.03	1	0.2	-	E
Benz[a]anthracene (PAH)	56-55-3	-	-	-	-	-	-	-	-	-	-	B2
Benzene	71-43-2	F	zero	0.005	F '87	0.2	0.2	**0.004**	0.1	-	0.1	**H**
Benzo[a]pyrene (PAH)	50-32-8	F	zero	0.0002	-	-	-	-	-	-	**0.0005**	B2
Benzo[b]fluoranthene (PAH)	205-99-2	-	-	-	-	-	-	-	-	-	-	B2
Benzo[g,h,i]perylene (PAH)	191-24-2	-	-	-	-	-	-	-	-	-	-	D
Benzo[k]fluoranthene (PAH)	207-08-9	-	-	-	-	-	-	-	-	-	-	B2
bis-2-Chloroisopropyl ether	39638-32-9	-	-	-	F '89	4	4	0.04	1	0.3	-	D
Bromacil	314-40-9	-	-	-	F '88	5	5	***0.1***	3.5	0.07	-	C
Bromobenzene	108-86-1	-	-	-	D '86	4	4	-	-	-	-	D

[1] Chemicals evaluated under the 2005 Cancer Guidelines or the 1996 or 1999 drafts are demoted by an abbreviation for their weight-of-the-evidence descriptor (see page iii). If the agency has not completed a new assessment for the chemical, the 1986 Guidelines Group designation (see page iii) is given in the Cancer Descriptor column.

[2].When acrylamide is used in drinking water systems, the combination (or product) of dose and monomer level shall not exceed that equivalent to a polyacrylamide polymer containing 0.05% monomer dosed at 1 mg/L.

[3] The MCL value for any combination of two or more of these three chemicals should not exceed 0.007 mg/L because of similar mode of action.

[4] Administrative stay of the effective date.

[5] PAH = Polycyclic aromatic hydrocarbon.

Chemicals	CASRN Number	Standards			Status HA Document	Health Advisories						Cancer Descriptor
						10-kg Child						
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10^{-4} Cancer Risk	
Bromochloromethane	74-97-5	-	-	-	F '89	50	1	0.01	0.5	0.09	-	D
Bromodichloromethane (THM)	75-27-4	F	zero	0.08[1]	-	1	0.6	0.003	0.1	-	0.1	L
Bromoform (THM)	75-25-2	F	zero	0.08[1]	-	5	0.2	0.03	1	-	0.8	L
Bromomethane	74-83-9	-	-	-	D '89	0.1	0.1	0.001	0.05	0.01	-	D
Butyl benzyl phthalate	85-68-7	-	-	-	-	-	-	0.2	7	-	-	C
Butylate	2008-41-5	-	-	-	F '89	2	2	0.05	2	0.4	-	D
Carbaryl	63-25-2	-	-	-	F '88	1	1	***0.01***	0.4	-	4	***L***
Carbofuran	1563-66-2	F	0.04	0.04	F '87	-	-	***0.00006***	-	-	-	***N***
Carbon tetrachloride	56-23-5	F	zero	0.005	F '87	4	0.2	0.0007	0.03	-	0.03	B2
Carboxin	5234-68-4	-	-	-	F '88	1	1	0.1	3.5	0.7	-	D
Chloramben	133-90-4	-	-	-	F '88	3	3	0.015	0.5	0.1	-	D
Chlordane	57-74-9	F	zero	0.002	F '87	0.06	0.06	**0.0005**	0.02	-	**0.01**	B2
Chloroform (THM)	67-66-3	F	0.07	0.08[1]	-	4	4	**0.01**	0.35	0.07	-	**L/N**
Chloromethane	74-87-3	-	-	-	F '89	9	0.4	0.004	0.1	0.03	-	**D**
Chlorophenol (2-)	95-57-8	-	-	-	D '94	0.5	0.5	0.005	0.2	0.04	-	D
Chlorothalonil	1897-45-6	-	-	-	F '88	0.2	0.2	0.015	0.5	-	0.15	B2
Chlorotoluene o-	95-49-8	-	-	-	F '89	2	2	0.02	0.7	0.1	-	D
Chlorotoluene p-	106-43-4	-	-	-	F '89	2	2	0.02	0.7	0.1	-	D
Chlorpyrifos	2921-88-2	-	-	-	F '92	0.03	0.03	***0.0003***	0.01	0.002	-	***D***
Chrysene (PAH)	218-01-9	-	-	-	-	-	-	-	-	-	-	B2
Cyanazine	21725-46-2	-	-	-	D '96	0.1	0.1	0.002	0.07	0.001	-	

[1] 1998 Final Rule for Disinfectants and Disinfection By-products: The total for trihalomethanes (THM) is 0.08 mg/L.

Chemicals	CASRN Number	Standards			Status HA Document	Health Advisories						Cancer Descriptor
						10-kg Child						
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/ day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10^{-4} Cancer Risk	
Cyanogen chloride[1]	506-77-4	-	-	-	-	0.05	0.05	0.05	2	-	-	D
2,4-D (2,4-dichlorophenoxyacetic acid)	94-75-7	F	0.07	0.07	F '87	1	0.3	***0.005***	0.2	-	-	***D***
DCPA (Dacthal)	1861-32-1	-	-	-	F '88	80	80	***0.01***	0.35	0.07	-	***C***
Dalapon (sodium salt)	75-99-0	F	0.2	0.2	F '89	3	3	0.03	0.9	0.2	-	D
Di(2-ethylhexyl)adipate	103-23-1	F	0.4	0.4	-	20	20	0.6	20	0.4	3	C
Di(2-ethylhexyl)phthalate	117-81-7	F	zero	0.006	-	-	-	0.02	0.7	-	0.3	B2
Diazinon	333-41-5	-	-	-	F '88	0.02	0.02	***0.0002***	0.007	0.001	-	***E***
Dibromochloromethane (THM)	124-48-1	F	0.06	0.08[2]	-	0.6	0.6	0.02	0.7	0.06	0.08	S
Dibromochloropropane (DBCP)	96-12-8	F	zero	0.0002	F '87	0.2	0.05	-	-	-	0.003	B2
Dibutyl phthalate	84-74-2	-	-	-	-	-	-	0.1	4	-	-	D
Dicamba	1918-00-9	-	-	-	F '88	-	-	***0.5***	18	4	-	***N***
Dichloroacetic acid	76-43-6	F	zero	0.06[3]	-	5	5	**0.004**	0.1	-	**0.07**	**L**
Dichlorobenzene o-	95-50-1	F	0.6	0.6	F '87	9	9	0.09	3	0.6	-	D
Dichlorobenzene —[4]	541-73-1	-	-	-	F '87	9	9	0.09	3	0.6	-	D
Dichlorobenzene p-	106-46-7	F	0.075	0.075	F '87	11	11	0.1	4	0.075	-	C
Dichlorodifluoromethane	75-71-8	-	-	-	F '89	40	40	0.2	5	1	-	D
Dichloroethane (1,2-)	107-06-2	F	zero	0.005	F '87	0.7	0.7	-	-	-	0.04	B2
Dichloroethylene (1,1-)	75-35-4	F	0.007	0.007	F '87	2	1	**0.05**	2	-	**0.006**	**S**
Dichloroethylene (cis-1,2-)	156-59-2	F	0.07	0.07	F '90	4	1	0.01	0.35	0.07	-	D
Dichloroethylene (trans-1,2-)	156-60-5	F	0.1	0.1	F '87	20	1	**0.02**	0.7	0.1	-	D
Dichloromethane	75-09-2	F	zero	0.005	D '93	10	2	0.06	2	-	0.5	B2
Dichlorophenol (2,4-)	120-83-2	-	-	-	D '94	0.03	0.03	0.003	0.1	0.02	-	E
Dichloropropane (1,2-)	78-87-5	F	zero	0.005	F '87	-	0.09	-	-	-	0.06	B2
Dichloropropene (1,3-)	542-75-6	-	-	-	F '88	0.03	0.03	**0.03**	1	-	**0.04**	**L**
Dieldrin	60-57-1	-	-	-	F '88	0.0005	0.0005	0.00005	0.002	-	0.0002	B2
Diethyl phthalate	84-66-2	-	-	-	-	-	-	0.8	30	-	-	D

[1] Under review.
[2] 1998 Final Rule for Disinfectants and Disinfection By-products: The total for trihalomethanes is 0.08 mg/L.
[3] 1998 Final Rule for Disinfectants and Disinfection By-products: The total for five haloacetic acids is 0.06 mg/L.
[4] The values for m-dichlorobenzene are based on data for o-dichlorobenzene.

Chemicals	CASRN Number	Standards			Status HA Document	Health Advisories						Cancer Descriptor
						10-kg Child						
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10^{-4} Cancer Risk	
Diisopropyl methylphosphonate	1445-75-6	-	-	-	F '89	8	8	0.08	3	0.6	-	D
Dimethrin	70-38-2	-	-	-	F '88	10	10	0.3	10	2	-	D
Dimethyl methylphosphonate	756-79-6	-	-	-	F '92	2	2	0.2	7	0.1	0.7	C
Dimethyl phthalate	131-11-3	-	-	-	-	-	-	-	-	-	-	D
Dinitrobenzene (1,3-)	99-65-0	-	-	-	F '91	0.04	0.04	0.0001	0.005	0.001	-	D
Dinitrotoluene (2,4-)	121-14-2	-	-	-	F '92	0.50	0.50	0.002	0.1	-	0.005	B2
Dinitrotoluene (2,6-)	606-20-2	-	-	-	F '92	0.40	0.40	0.001	0.04	-	0.005	B2
Dinitrotoluene (2,6 & 2,4) [1]		-	-	-	F '92	-	-	-	-	-	0.005	B2
Dinoseb	88-85-7	F	0.007	0.007	F '88	0.3	0.3	0.001	0.035	0.007	-	D
Dioxane p-	123-91-1	-	-	-	F '87	4	0.4	-	-	-	**0.3**	B2
Diphenamid	957-51-7	-	-	-	F '88	0.3	0.3	0.03	1	0.2	-	D
Diquat	85-00-7	F	0.02	0.02	-	-	-	***0.005***	0.02	-	-	***E***
Disulfoton	298-04-4	-	-	-	F '88	0.01	0.01	***0.0001***	0.0035	0.0007	-	***E***
Dithiane (1,4-)	505-29-3	-	-	-	F '92	0.4	0.4	0.01	0.4	0.08	-	D
Diuron	330-54-1	-	-	-	F '88	1	1	***0.003***	0.1	-	0.2	***L***
Endothall	145-73-3	F	0.1	0.1	F '88	0.8	0.8	***0.007***	0.25	0.05	-	***N***
Endrin	72-20-8	F	0.002	0.002	F '87	0.02	0.005	**0.0003**	0.01	0.002	-	D
Epichlorohydrin	106-89-8	F	zero	TT[2]	F '87	0.1	0.1	0.002	0.07	-	**0.3**	B2
Ethylbenzene	100-41-4	F	0.7	0.7	F '87	30	3	0.1	3	0.7	-	D
Ethylene dibromide (EDB)[3]	106-93-4	F	zero	0.00005	F '87	0.008	0.008	**0.009**	0.3	-	0.002	**L**
Ethylene glycol	107-21-1	-	-	-	F '87	20	6	**2**	70	14	-	D
Ethylene Thiourea (ETU)	96-45-7	-	-	-	F '88	0.3	0.3	**0.00008**	0.003	-	0.02	B2
Fenamiphos	22224-92-6	-	-	-	F '88	0.009	0.009	***0.0001***	0.0035	0.0007	-	***E***

[1] Technical grade.

[2] When epichlorohydrin is used in drinking water systems, the combination (or product) of dose and monomer level shall not exceed that equivalent to an epichlorohydrin-based polymer containing 0.01% monomer dosed at 20 mg/L.

[3] 1,2-dibromoethane.

Chemicals	CAS Number	Standards			Status HA Standards	Health Advisories						Cancer Descriptor
						10-kg Child						
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10^{-4} Cancer Risk	
Fluometuron	2164-17-2	-	-	-	F '88	2	2	0.01	0.5	0.09		D
Fluorene (PAH)	86-73-7	-	-	-	-	-	-	0.04	1	-	-	D
Fonofos	944-22-9	-	-	-	F '88	0.02	0.02	0.002	0.07	0.01	-	N
Formaldehyde	50-00-0	-	-	-	D '93	10	5	**0.2**	7	1	-	B1[1]
Glyphosate	1071-83-6	F	0.7	0.7	F '88	20	20	***2***	70	-	-	D
Heptachlor	76-44-8	F	zero	0.0004	F '87	0.01	0.01	0.0005	0.02	-	0.0008	B2
Heptachlor epoxide	1024-57-3	F	zero	0.0002	F '87	0.01	-	0.00001	0.0004	-	0.0004	B2
Hexachlorobenzene	118-74-1	F	zero	0.001	F '87	0.05	0.05	0.0008	0.03	-	0.002	B2
Hexachlorobutadiene[2]	87-68-3	-	-	-	-	0.3	0.3	0.0003	0.01	-	0	L
Hexachlorocyclopentadiene	77-47-4	F	0.05	0.05	-	-	-	**0.006**	0.2	-	-	**N**
Hexachloroethane	67-72-1	-	-	-	F '91	5	5	0.001??	0.04	0.001	**0.3**	C
Hexane (n-)	110-54-3	-	-	-	F '87	10	4	-	-	-	-	**I**
Hexazinone	51235-04-2	-	-	-	F '96	3	2	***0.05***	2	0.4	-	D
HMX[3]	2691-41-0	-	-	-	F '88	5	5	0.05	2	0.4	-	D
Indeno[1,2,3,-c,d]pyrene (PAH)	193-39-5	-	-	-	-	-	-	-	-	-	-	B2
Isophorone	78-59-1	-	-	-	F '92	15	15	0.2	7	0.1	4	C
Isopropyl methylphosphonate	1832-54-8	-	-	-	F '92	30	30	0.1	3.5	0.7	-	D
Isopropylbenzene (cumene)	98-82-8	-	-	-	D '87	11	11	0.1	4	-	-	D
Lindane [4]	58-89-9	F	0.0002	0.0002	F '87	1	1	***0.005***	0.2	-	-	***S***
Malathion	121-75-5	-	-	-	F '92	0.2	0.2	0.02	0.8	0.1	-	D
Maleic hydrazide	123-33-1	-	-	-	F '88	10	10	0.5	20	4	-	D
MCPA [5]	94-74-6	-	-	-	F '88	0.1	0.1	***0.004***	0.14	0.03	-	***N***
Methomyl	16752-77-5	-	-	-	F '88	0.3	0.3	0.025	0.9	0.2	-	E
Methoxychlor	72-43-5	F	0.04	0.04	F '87	0.05	0.05	**0.005**	0.2	0.04	-	D
Methyl ethyl ketone	78-93-3	-	-	-	F '87	75	7.5	**0.6**	**20**	**4**	-	D
Methyl parathion	298-00-0	-	-	-	F '88	0.3	0.3	***0.0002***	0.007	0.001	-	***N***

[1] Carcinogenicity based on inhalation exposure.
[2] Regulatory Determination Health Effects Support Document for Hexachlorobutadiene (http://www.epa.gov/safewater/ccl/pdfs/reg_determine1/support_cc1_hexachlorobutadiene_healtheffects.pdf).
[4] HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine.
[5] Lindane = γ – hexachlorocyclohexane.
[6] MCPA = 4(chloro-2-methoxyphenoxy)acetic acid.

Chemicals	CASRN Number	Standards			Status HA Document	Health Advisories						Cancer Descriptor
						10-kg Child						
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10^{-4} Cancer Risk	
Metolachlor	51218-45-2	-	-	-	F '88	2	2	***0.1***	3.5	0.7	-	***C***
Metribuzin	21087-64-9	-	-	-	F '88	5	5	***0.01***	0.35	0.07	-	***D***
Monochloroacetic acid	79-11-8	F	0.03	0.06[1]	-	0.2	0.2	0.01	0.35	0.07	-	I
Monochlorobenzene	108-90-7	F	0.1	0.1	F '87	4	4	**0.02**	0.7	0.1	-	D
Naphthalene	91-20-3	-	-	-	F '90	0.5	0.5	**0.02**	0.7	0.1	-	**I**
Nitrocellulose[2]	9004-70-0	-	-	-	F '88	-	-	-	-	-	-	-
Nitroguanidine	556-88-7	-	-	-	F '90	10	10	0.1	3.5	0.7	-	D
Nitrophenol p-	100-02-7	-	-	-	F '92	0.8	0.8	0.008	0.3	0.06	-	D
Oxamyl (Vydate)	23135-22-0	F	0.2	0.2	F '05	0.01	0.01	0.001	0.035		-	N
Paraquat	1910-42-5	-	-	-	F '88	0.1	0.1	0.0045	0.2	0.03	-	**C**
Pentachlorophenol	87-86-5	F	zero	0.001	F '87	1	0.3	0.03	1	-	0.03	B2
Phenanthrene (PAH)	85-01-8	-	-	-	-	-	-	-	-	-	-	D
Phenol	108-95-2	-	-	-	D '92	6	6	**0.3**	11	2	-	D
Picloram	1918-02-1	F	0.5	0.5	F '88	20	20	***0.02***	7	-	-	D
Polychlorinated biphenyls (PCBs)	1336-36-3	F	zero	0.0005	D '93	-	-	-	-	-	0.01	B2
Prometon	1610-18-0	-	-	-	F '88	0.2	0.2	0.015	0.5	0.1	-	D
Pronamide	23950-58-5	-	-	-	F '88	0.8	0.8	***0.08***	3	-	0.2	***B2***
Propachlor	1918-16-7	-	-	-	F '88	0.5	0.5	***0.05***	2	-	0.1	***L***
Propazine	139-40-2	-	-	-	F '88	-	-	***0.02***	0.7	0.01	-	***N***
Propham	122-42-9	-	-	-	F '88	5	5	0.02	0.6	0.1	-	D
Pyrene (PAH)	129-00-0	-	-	-	-	-	-	0.03	-	-	-	D
RDX[3]	121-82-4	-	-	-	F '88	0.1	0.1	0.003	0.1	0.002	0.03	C
Simazine	122-34-9	F	0.004	0.004	F '88	-	-	***0.02***	0.7	-	-	***N***
Styrene	100-42-5	F	0.1	0.1	F '87	20	2	0.2	7	0.1	-	C
2,4,5-T (Trichlorophenoxy-acetic acid)	93-76-5	-	-	-	F '88	0.8	0.8	0.01	0.35	0.07	-	D

[1] 1998 Final Rule for Disinfectants and Disinfection By-products: the total for five haloacetic acids is 0.06mg/L.
[2] The Health Advisory Document for nitrocellulose does not include HA values and describes this compounds as relatively nontoxic.
[3] RDX = hexahydro -1,3,5-trinitro-1,3,5-triazine.

Chemicals	CASRN Number	Standards			Status HA Document	Health Advisories						Cancer Descriptor
						10-kg Child						
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10^{-4} Cancer Risk	
2,3,7,8-TCDD (Dioxin)	1746-01-6	F	zero	3E-08	F '87	1E-06	1E-07	1E-09	4E-08	-	2E-08	B2
Tebuthiuron	34014-18-1	-	-	-	F '88	3	3	0.07	2	0.5	-	D
Terbacil	5902-51-2	-	-	-	F '88	0.3	0.3	0.01	0.4	0.09	-	E
Terbufos	13071-79-9	-	-	-	F '88	0.005	0.005	***0.00005***	0.002	0.0004	-	D
Tetrachloroethane (1,1,1,2-)	630-20-6	-	-	-	F '89	2	2	0.03	1	0.07	0.1	C
Tetrachloroethane (1,1,2,2-)	79-34-5	-	-	-	F '89	0.04	0.04	0.00005	0.002	0.0003	0.02	C
Tetrachloroethylene[1]	127-18-4	F	zero	0.005	F '87	2	2	0.01	0.5	0.01	-	-
Trichlorofluoromethane	75-69-4	-	-	-	F '89	7	7	0.3	10	2	-	D
Toluene	108-88-3	F	1	1	D '93	20	2	**0.08**	3	-	-	**I**
Toxaphene	8001-35-2	F	zero	0.003	F '96	0.004	0.004	0.0004	0.01	-	0.003	B2
2,4,5-TP (Silvex)	93-72-1	F	0.05	0.05	F '88	0.2	0.2	0.008	0.3	0.05	-	D
Trichloroacetic acid	76-03-9	F	0.02	0.06[2]	-	3	3	0.03	1	0.02	-	S
Trichlorobenzene (1,2,4-)	120-82-1	F	0.07	0.07	F '89	0.1	0.1	**0.01**	0.35	0.07	-	D
Trichlorobenzene (1,3,5-)	108-70-3	-	-	-	F '89	0.6	0.6	0.006	0.2	0.04	-	D
Trichloroethane (1,1,1-)	71-55-6	F	0.2	0.2	F '87	100	40	0.035	1	0.2	-	D
Trichloroethane (1,1,2-)	79-00-5	F	0.003	0.005	F '89	0.6	0.4	0.004	0.1	0.003	0.06	C
Trichloroethylene [1]	79-01-6	F	zero	0.005	F '87	-	-	0.007	0.2	-	0.3	B2
Trichlorophenol (2,4,6-)	88-06-2	-	-	-	D '94	0.03	0.03	0.0003	0.01	-	0.3	B2
Trichloropropane (1,2,3-)	96-18-4	-	-	-	F '89	0.6	0.6	0.006	0.2	0.04	-	-
Trifluralin	1582-09-8	-	-	-	F '90	0.08	0.08	***0.02***	0.7	0.01	0.4	***C***
Trimethylbenzene (1,2,4-)	95-63-6	-	-	-	D '87	-	-	-	-	-	-	D
Trimethylbenzene (1,3,5-)	108-67-8	-	-	-	D '87	10	-	-	-	-	-	D
Trinitroglycerol	55-63-0	-	-	-	F '87	0.005	0.005	-	-	0.005	0.2	-
Trinitrotoluene (2,4,6-)	118-96-7	-	-	-	F '89	0.02	0.02	0.0005	0.02	0.002	0.1	C
Vinyl chloride	75-01-4	F	zero	0.002	F '87	3	3	**0.003**	0.1	-	**0.002**	**H**
Xylenes	1330-20-7	F	10	10	D '93	40	40	**0.2**	7	-	-	**I**

[1] Under review.
[2] 1998 Final Rule for Disinfectants and Disinfection By-products: The total for five haloacetic acids is 0.06 mg/L.

Chemicals	CASRN Number	Standards			Status HA Document	Health Advisories						Cancer Descriptor
						10-kg Child						
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10^{-4} Cancer Risk	
INORGANICS												
Ammonia	7664-41-7	-	-	-	D '92	-	-	-	-	30	-	D
Antimony	7440-36-0	F	0.006	0.006	F '92	0.01	0.01	0.0004	0.01	0.006	-	D
Arsenic	7440-38-2	F	zero	0.01	D '95	-	-	**0.0003**	0.01	-	**0.002**	A
Asbestos (fibers/l >10µm length)	1332-21-4	F	7 MFL[1]	7 MFL	-	-	-	-	-	-	700-MFL	A[2]
Barium	7440-39-3	F	2	2	D '93	0.7	0.7	**0.2**	7	-	-	**N**
Beryllium	7440-41-7	F	0.004	0.004	F '92	30	30	**0.002**	0.07	-	-	-
Boron	7440-42-8	-	-	-	D '92	4	0.9	**0.2**	7	1	-	**I**
Bromate	7789-38-0	F	zero	0.01	D '98	0.2	-	**0.004**	0.14	-	0.005	B2
Cadmium	7440-43-9	F	0.005	0.005	F '87	0.04	0.04	0.0005	0.02	0.005	-	D
Chloramine[3]	10599-90-3	F	4[4]	4[4]	D '95	1	1	0.1	3.5	3.0	-	-
Chlorine	7782-50-5	F	4[4]	4[4]	D '95	3	3	0.1	5	4	-	D
Chlorine dioxide	10049-04-4	F	0.8[4]	0.8[4]	D '98	0.84	0.84	0.03	1	0.8	-	D
Chlorite	7758-19-2	F	0.8	1	D '98	0.84	0.84	0.03	1	0.8	-	D
Chromium (total)	7440-47-3	F	0.1	0.1	F '87	1	1	**0.003**[5]	0.1	-	-	D
Copper (at tap)	7440-50-8	F	1.3	TT[6]	D '98	-	-	-	-	-	-	D
Cyanide	143-33-9	F	0.2	0.2	F '87	0.2	0.2	0.02[7]	0.8	0.2	-	D
Fluoride	7681-49-4	F	4	4	-	-	-	**0.06**[8]	-	-	-	-
Lead (at tap)	7439-92-1	F	zero	TT[6]	-	-	-	-	-	-	-	B2
Manganese	7439-96-5	-	-	-	F"04	1	1	0.14[9]	1.6	0.3	-	D
Mercury (inorganic)	7487-94-7	F	0.002	0.002	F '87	0.002	0.002	**0.0003**	0.01	0.002	-	D
Molybdenum	7439-98-7	-	-	-	D '93	0.08	0.08	0.005	0.2	0.04	-	D
Nickel	7440-02-0	F	-	-	F '95	1	1	0.02	0.7	0.1	-	-

[1] MFL = million fibers per liter.
[2] Carcinogenicity based on inhalation exposure.
[3] Monochloramine; measured as free chlorine.
[4] 1998 Final Rule for Disinfectants and Disinfection By-products: MRDLG=Maximum Residual Disinfection Level Goal; and MRDL=Maximum Residual Disinfection Level.
[5] IRIS value for chromium VI.
[6] Copper action level 1.3 mg/L; lead action level 0.015 mg/L.
[7] This RfD is for hydrogen cyanide.
[8] Based on dental fluorosis in children, a cosmetic effect. MCLG based on skeletal fluorosis.
[9] Dietary manganese. The lifetime health advisory includes a 3 fold modifying factor to account for increased bioavailability from drinking water.

Chemicals	CASRN Number	Standards			Status HA Document	Health Advisories						Cancer Descriptor
						10-kg Child						
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10^{-4} Cancer Risk	
Nitrate (as N)	14797-55-8	F	10	10	D '93	10[1]	10[1]	1.6	-	-	-	-
Nitrite (as N)	14797-65-0	F	1	1	D '93	1[1]	1[1]	0.16	-	-	-	-
Nitrate + Nitrite (both as N)		F	10	10	D '93	-	-	-	-	-	-	-
Selenium	7782-49-2	F	0.05	0.05	-	-	-	0.005	0.2	0.05	-	D
Silver	7440-22-4	-	-	-	F '92	0.2	0.2	0.005[2]	0.2	0.1	-	D
Strontium	7440-24-6	-	-	-	D '93	25	25	**0.6**	20	4	-	D
Thallium	7440-28-0	F	0.0005	0.002	F '92	0.007	0.007	0.00007	0.002	0.0005	-	-
White phosphorous	7723-14-0	-	-	-	F '90	-	-	0.00002	0.0005	0.0001		D
Zinc	7440-66-6	-	-	-	D '93	6	6	0.3	10	2	-	**I**
RADIONUCLIDES												
Beta particle and photon activity (formerly man-made radionuclides)		F	zero	4 mrem/yr	-	-	-	-	-	-	4 mrem/yr	A
Gross alpha particle activity		F	zero	15 pCi/L	-	-	-	-	-	-	15 pCi/L	A
Combined Radium 226 & 228	7440-14-4	F	zero	5 pCi/L	-	-	-	-	-	-	-	A
Radon	10043-92-2	P	zero	300 pCi/L AMCL[3] 4000 pCi/L	-	-	-	-	-	-	150 pCi/L	A
Uranium	7440-61-1	F	zero	30 µg/L	-	-	-	0.0006[4]	0.02	-	-	A

[1] These values are calculated for a 4-kg infant and are protective for all age groups.
[2] Based on a cosmetic effect.
[3] AMCL = Alternative Maximum Contaminant Level
[4] Soluble uranium salts. Radionuclide Rule.

Secondary Drinking Water Regulations

Chemicals	CAS Number	Status	SDWR
Aluminum	7429-90-5	F	0.05 to 0.2 mg/L
Chloride	7647-14-5	F	250 mg/L
Color	NA	F	15 color units
Copper	7440-50-8	F	1.0 mg/L
Corrosivity	NA	F	non-corrosive
Fluoride	7681-49-4	F	2.0 mg/L
Foaming agents	NA	F	0.5 mg/L
Iron	7439-89-6	F	0.3 mg/L
Manganese	7439-96-5	F	0.05 mg/L
Odor	NA	F	3 threshold odor numbers
pH	NA	F	6.5 – 8.5
Silver	7440-22-4	F	0.1 mg/L
Sulfate	7757-82-6	F	250 mg/L
Total dissolved solids (TDS)	NA	F	500 mg/L
Zinc	7440-66-6	F	5 mg/L

Microbiology

	Status Reg.	Status HA Document	MCLG	MCL	Treatment Technique
Cryptosporidium	F	F 01	-	TT	Systems that filter must remove 99% of *Cryptosporidium*
Giardia lamblia	F	F 98	-	TT	99.9% killed/inactivated
Legionella	F[1]	F 01	zero	TT	No limit; EPA believes that if *Giardia* and viruses are inactivated, *Legionella* will also be controlled
Heterotrophic Plate Count (HPC)	F[1]	-	NA	TT	No more than 500 bacterial colonies per milliliter.
Mycobacteria	-	F 99	-	-	-
Total Coliforms	F	-	zero	5%	No more than 5.0% samples total coliform-positive in a month. Every sample that has total coliforms must be analyzed for fecal coliforms; no fecal coliforms are allowed.
Turbidity	F	-	NA	TT	At no time can turbidity go above 5 NTU (nephelometric turbidity units)
Viruses	F[1]	-	zero	TT	99.99% killed/inactivated

[1] Final for systems using surface water; also being considered for regulation under groundwater disinfection rule.

Drinking Water Advisory Table

Chemicals	Status	Health-based Value	Taste Threshold	Odor Threshold
Ammonia	**D '92**	**Not Available**	**30 mg/L**	
Methyl tertiary butyl ether (MtBE)	**F '98**	**Not Available**	**40 μg/L**	**20 μg/L**
Sodium	**F '03**	**20 mg/L (for individuals on a 500 mg/day restricted sodium diet).**	**30-60 mg/L**	
Sulfate	**F '03**	**500 mg/L**	**250 mg/L**	

Taste Threshold: Concentration at which the majority of consumers do not notice an adverse taste in drinking water; it is recognized that some sensitive individuals may detect a chemical at levels below this threshold.

Odor Threshold: Concentration at which the majority of consumers do not notice an adverse odor in drinking water; it is recognized that some sensitive individuals may detect a chemical at levels below this threshold.